Product Brief

Advanced Remote Node (ARN)

Enterprise Access Router

- *Delivers extended interface density and flexibility*
- *Supports high-performance networking*
- *Provides maximum investment protection*

The Advanced Remote Node (ARN*) from Nortel Networks delivers an innovative access router architecture with the performance and modularity to solve today's application needs and meet the increasing demands of the evolving corporate intranet.

The ARN design integrates the functions of multiple devices to reduce the complexity of remote network management. Nortel Networks high-speed access routers significantly lower the total cost of ownership and provide the highest degree of investment protection for enterprise networks.

The local area network (LAN – Ethernet, 10/100Base-TX, 100Base-FX, and Token Ring) interfaces of the ARN offer flexible connectivity. Its two wide area network (WAN) adapter module "slots" provide an array of options for integrating devices (ISDN BRI, Data Service Unit/Channel Service Unit [DSU/CSU], V.34 modem) for primary and backup WAN connectivity. This modular design reduces the number of physical devices and amount of cabling required for system operation, and also facilitates remote network management.

Nortel Networks Routing Services (BayRS*) software offers the most comprehensive WAN service support (leased line, Frame Relay, X.25, SMDS, Dial Services, even ATM), allowing customers to choose the most cost-effective primary and backup links available for their remote site applications. BayRS software WAN optimization features supply key benefits such as Data Compression, Traffic Prioritization, Uniform Traffic Filters, and Dial Optimized Routing. Increasing available network bandwidth and maximizing traffic control significantly reduces costs.

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Optional expansion modules—including a choice of Ethernet/Multiserial, 7-serial, or tri-serial—offer additional serial interfaces. The expansion module can also hold a LAN interface for integrating existing low-speed legacy device traffic (Synchronous Data Link Control [SDLC], Binary Synchronous Communications [BSC], polled Async, or X.25) and LAN-based client/server traffic over a consolidated WAN link to the corporate backbone.

The ARN employs Motorola MC68040 and MC68360 microprocessors to handle the demands of compute-intensive internetwork applications. This includes multiprotocol routing, SNA integration, traffic management, and high-speed WAN communication.

Seamless integration with the enterprise internetwork is ensured through Nortel Networks Optivity* network management application support for comprehensive node configuration, monitoring, and control. Optional embedded Ethernet Remote Monitoring (RMON) probes—Data Collection Modules (DCMs)—provide visibility into network activity at remote sites where there is typically no dedicated support staff. Software RMON support is available for the 10-Mbps and 100-Mbps systems.

The ARN is a critical part of the product family. Combined with the 10BaseT stackable hubs, 100BaseT hubs, Ethernet/Fast Ethernet switches, and remote access devices, the ARN delivers a robust, scalable solution for providing remote office connectivity to the enterprise network.

Benefits

Delivers extended interface density and flexibility

With support for up to four LAN and seven serial interfaces, the ARN provides an ideal platform for remote sites combining multiple core legacy devices (SDLC, BSC, polled Async or X.25) and LAN-based client/server traffic (IP and IPX) over Frame Relay, X.25, X.25 PAD leased line, or dial (analog or ISDN) links *(see Figure 1)*.

By integrating transmission devices such as 56K or T1/E1/FT1/FE1 CSU/DSUs, ISDN BRI, or modems into the ARN chassis, the number of multivendor, separately managed devices and cabling is reduced. This simplifies remote management and enhances reliability.

Supports high-performance networking

The high-performance architecture of the ARN supports concurrent execution of compute-intensive applications including SNA network integration (Data Link Switching-DLSw), Advanced Peer-to-Peer Networking (APPN), SDLC, WAN bandwidth optimization (compression, prioritization, filters), and remote office link security (firewalling, encryption). Two types of link routing are supported: wire-speed LAN-to-LAN (Ethernet, Fast Ethernet, and/or Token Ring) and multiple high-speed WAN (T1/FT1/E1).

Provides maximum investment protection

Beyond answering the needs of most current remote networks, the futureproof design of the ARN provides ample performance headroom for emerging application requirements. The continuing development of WAN adapter modules assures an easy, cost-effective migration path for upgrading to the newest WAN access technologies.

Features

High-performance processors and memory modules

The high-performance, highly flexible base unit of the ARN router contains a Motorola 33 MHz MC68040 microprocessor, ensuring high forwarding and filtering rates across each of its network interfaces.

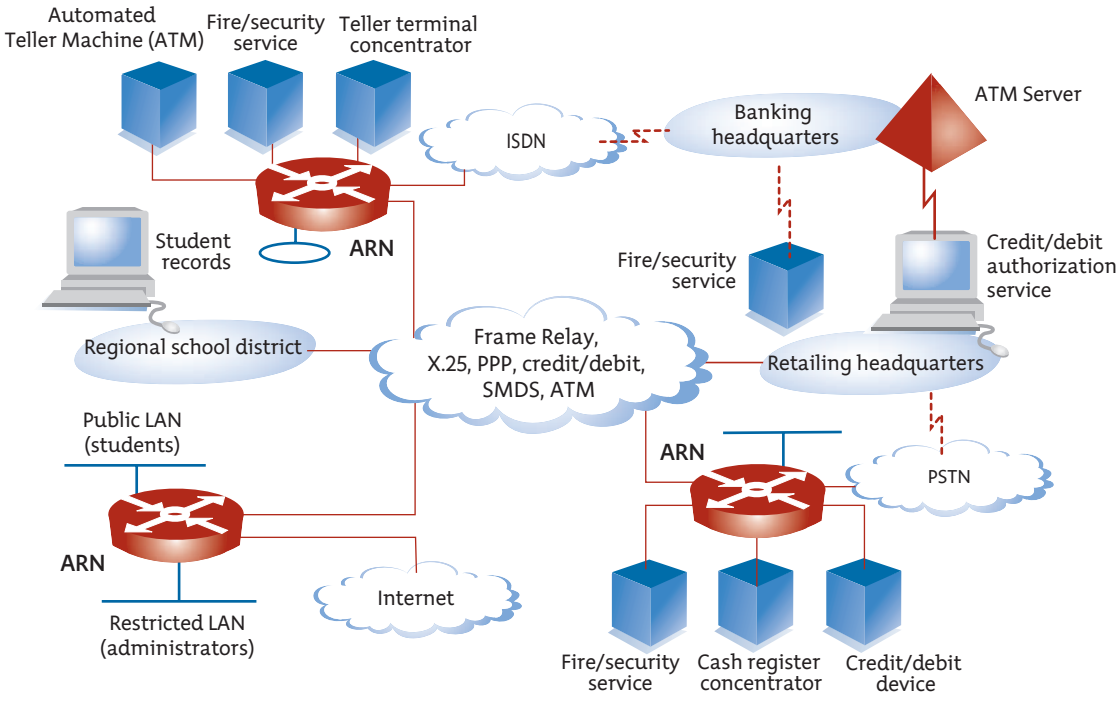

Figure 1: *Network design options*

In addition, 8, 16, or 32 megabytes (MB) of DRAM can be installed and configured to support customized partitioning between local and global memory. Router software resides in local memory while global memory is dedicated to packet buffers. Through these reserved buffers, the ARN prevents traffic overflow and resulting network delays caused by large bursts of traffic, such as file transfer operations.

Base module LAN interfaces

The ARN can be configured to support 10Base-T Ethernet, autosense 10/100Base-TX (Fast Ethernet), 100Base-FX (Fast Ethernet), and Token Ring to meet a wide variety of connectivity requirements.

10Base-T Ethernet/802.3
The 10Base-T Ethernet/802.3 interface supports IEEE 802.3 and Version 1.0/2.0 Ethernet formats. Both an AUI (DB-15) and RJ-45 connector are provided for a choice of connectivity.

10/100Base-TX
The ARN 100Base-T interfaces support the copper and fiber optic 100Base-T cabling standards—100Base-TX and 100Base-FX—for flexible connectivity. The 10/100Base-TX autosensing interface automatically senses the line speed (either 10 Mbps or 100 Mbps), providing a high-speed LAN connection to branch offices as they migrate to Fast Ethernet technologies. An RJ-45 connector is provided for cable connection. The 100Base-FX interface provides an ST connector to allow the use of fiber optic (100Base-FX) cable.

Token Ring
The Token Ring interface can operate at either 4 or 16 Mbps ring speeds (software configurable), providing the flexibility to migrate to higher speeds as performance requirements dictate. A 9-pin D subminiature (DB-9) connector for Shielded Twisted Pair (STP) and an RJ-45 connector for Unshielded Twisted Pair (UTP) are provided for Token Ring cable attachment.

Base module expansion options

Personal Computer Memory Card International Association (PCMCIA) Flash Memory Card
The 8 or 16 MB of externally accessible PCMCIA Flash memory of the ARN allows for nonvolatile storage of router software and configuration files. Software image and configuration files can be downloaded remotely to the flash memory card, simplifying router upgrades and fault recovery procedures. To facilitate remote configuration and management, the PCMCIA flash memory card can even be programmed at the network center, mailed to a remote site, and easily installed by untrained personnel.

To provide redundancy, the PCMCIA flash memory card can be logically divided into two partitions of equal size. Each partition is a uniquely addressable and fully functional flash file system volume where copies of boot images and configuration files can be stored.

V.34 Console Modem Module
In addition to the standard console and external modem interfaces of the ARN, a V.34 console modem option can be installed to simplify remote router deployment. The module also supports out-of-band troubleshooting should remote network access become unavailable.

Redundant Power Supply Unit
For mission-critical deployments, an optional Nortel Networks Redundant Power Supply Unit (RPSU) can be connected to the ARN router, providing a secondary power source in case its primary power supply fails.

Ethernet RMON Probe
An optional DCM can be attached directly to the Ethernet base module of the ARN, providing comprehensive monitoring capability to the router. The probe contains a 25 MHz Motorola MC68040 microprocessor. It supports all nine groups of the Ethernet RMON MIB (RFC 1757), including Layer 3 traffic monitoring. Through continuous monitoring of the ARN router's Ethernet LAN segment, the DCM collects, correlates, and summarizes long-term network activity data. The resulting historical information can then be used to detect trends in network performance, faults, and traffic flows, as well as to determine the optimum configuration to maximize network performance.

LED matrix display

A comprehensive matrix of LEDs presents clear, at-a-glance status readouts of key ARN system components. This includes the base module, WAN adapters, expansion and data collection modules, PCMCIA memory, RPSU status, fans, and router software loading. Along with providing quick insights into the router's status, the LED matrix can also be used to supply networking administrators with a remote view of the router's status via SNMP.

Integral WAN connectivity

The ARN router's slide-in WAN adapter modules offer the functionality of WAN transmission devices, supplying an integrated solution that is easily managed as a single platform. The WAN flexible interfaces of the ARN enable users to choose among today's alternative wide area networking links, including Point-to-Point Protocol (PPP) (synchronous or asynchronous), Frame Relay, X.25, ISDN, Switched Multi-megabit Data Service (SMDS), or Asynchronous Transfer Mode (ATM).

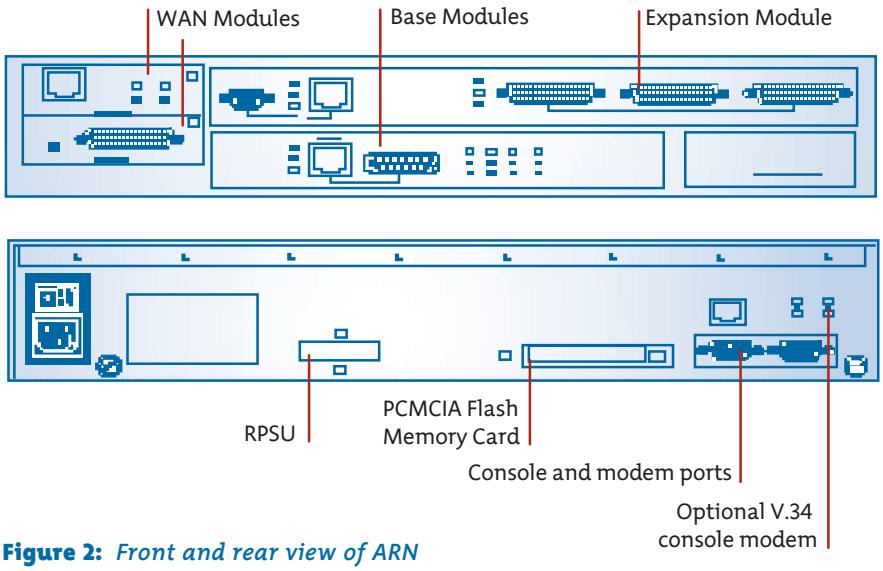

Figure 2: *Front and rear view of ARN*

Up to two WAN adapter modules can be inserted into the router. The modules ensure easy, cost-effective upgrades to newly available, higher bandwidth WAN services while preserving the initial router investment *(see Figure 2)*.

WAN adapter module options

Serial

The serial interface supports V.35, RS-232, RS-449/422 balanced, RS-530, and X.21. Using either internal or external clocking, serial interfaces can be operated at speeds from 1200 bps to 2.048 Mbps, full duplex, and support the use of T1 and E1 services.

The ARN router's serial interfaces can also be used to integrate remote site SNA devices such as SDLC and BSC controllers, allowing them to share WAN access with a site's LAN traffic. Nortel Networks support of BSC Pass-Through allows customers to converge BSC 3270 device traffic. Automated teller machine traffic, for example, can be put on a high-performance, multi-protocol IP backbone, eliminating costly dial-up BSC links. Using standard TCP/IP as the internetwork transport, dynamic rerouting capability provides added resiliency for mission-critical BSC data.

ISDN Basic Rate Interface (BRI)

Supplying two 64-kbps B-channels for data and one 16-kbps D-channel for signaling, ISDN BRI adapter modules provide an integrated, high-performance solution for companies interested in using the extensive dial services offered by Nortel Networks. They include Dial Backup, Dial-on-Demand, and Bandwidth-on-Demand.

ISDN BRI options are available with or without an integral Network Termination 1 (NT1) device, allowing users to choose the solution that best fits the requirements of each site. The ISDN BRI "U" adapter module provides the necessary integral NT1 interface for direct connection to most North American ISDN BRI networks. For locations where the NT1 interface is provided by a service provider or Public Telephone and Telegraph (PTT) company, the ISDN BRI "S/T" adapter module ensures the necessary connectivity. Both ISDN BRI modules support worldwide signaling specifications *(see Table 1)*.

T1/Fractional T1 Data Service Unit/ Channel Service Unit (DSU/CSU)

The T1 and Fractional T1 (FT1) DSU/CSU module offers high-speed connectivity to the digital services networks in North America. It is capable of operating at fractional T1 rates, in increments of 64 kbps, up to 1.544 Mbps. Users can customize the DS-0s in the FT1 connection. For example, users can select DS-0 # 1, 5, 15 and 18 to make up a 256-kbps Fractional T1 link. This module is designed to support one logical channel per one physical interface, typical of a remote branch office requirement. Extensive diagnostic and test functions—such as loopback and Bit Error Rate Test (BERT) tests—are also built in for easy troubleshooting.

E1/Fractional E1 adapter module

The E1 and Fractional E1 (FE1) adapter module provides a 2.048 Mbps G.703 interface for high-density access to a variety of international communications services.

56/64-kbps DSU/CS

The integral 56/64-kbps DSU/CSU adapter module provides direct synchronous access to either 56-kbps DDS or 64-kbps Clear Channel dedicated services, facilitating a simpler connection between the router and the service provider's facilities. Extensive diagnostic and loopback test capabilities—

Table 1: *Supported ISDN signaling specifications*

Region/Country	ISDN Standard
Australia	AUSTEL TS013
Europe	Euro ISDN (CTR4)
France	VN-3
Japan	INS-64
North America	National ISDN-1
	AT&T 4ESS and 5ESS ISDN
	Nortel Networks DMS-100 and DMS-250

including the generation of and response to ITU-T V.54 Remote Loopback—allow network administrators to readily pinpoint WAN connection difficulties with either router, DSU, or WAN facilities. This makes the ARN easier to troubleshoot.

V.34 modem

When Switched 56 or ISDN BRI services are not available or considered cost-effective, the ARN router's integral V.34 modem adapter module can be used to support Nortel Networks dial services capabilities. Modem adapter module speeds range from 1,200 bps to 115,200 bps on standard analog telephone lines. Providing nominal speeds of 28.8 kbps, the V.34 modem's standard V.42bis compression capabilities boost throughput to 115.2 kbps or greater. Standard V.42 and MNP 10 error correction capabilities also ensure reliable transmission of mission-critical data.

X.25 PAD

The ARN X.25 PAD option provides support for legacy applications that use the X.25 protocol for communications. Retail and banking customers are typical users of X.25. Many customers are planning to replace their X.25 backbone network with a more cost-effective backbone network—such as Frame Relay—using IP. The ARN PAD option offers the capability to these customers to migrate to an IP-based network. The PAD can use the IPEX feature to forward the packets destined to an X.25 host via a non-X.25 WAN backbone, such as Frame Relay. Or, the PAD can present X.25 data directly to an X.25 WAN backbone. *Figure 3* illustrates a typical X.25 PAD application.

Auxiliary remote expansion modules

The ARN router's optional expansion modules allow the router to be configured to support a second LAN interface (Ethernet or Token Ring) and/or three or seven serial (Synchronous/Asynchronous) interfaces. Along with the new ARN Ethernet/Multiserial and 7-serial expansion modules, options include Tri-Serial, Ethernet, Ethernet plus Tri-Serial, Token Ring, or Token Ring plus Tri-Serial. The expansion module's serial interfaces provide three connections for synchronous or asynchronous WAN circuits and/or legacy devices.

Similar to the base module of the ARN, Ethernet-based expansion modules can be continuously monitored through use of the Nortel Networks DCM.

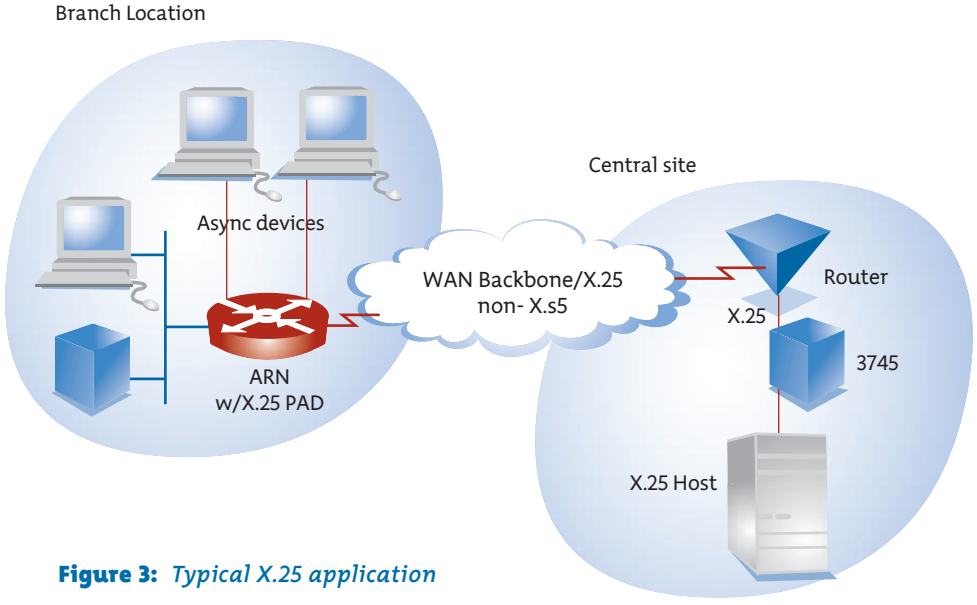

Figure 3: *Typical X.25 application*

Power options

The ARN is available with one 100 to 240 VAC power supply or one -48 VDC to -60 VDC power supply.

Maximized connectivity and interoperability via BayRS

The ARN runs BayRS router software to maximize efficiency for remote office connectivity in multivendor, multiprotocol environments and supports all major network and bridging protocols.

Software options

Three different levels of software are available for the ARN router, including IP Access, Remote Office, and Corporate (see *Table 3* at the end of this document). This allows the ARN to be configured with software that best fits the remote site's requirements.

Traffic management

Comprehensive traffic management capabilities are provided to the ARN router through the use of BayRS Data Compression, Traffic Prioritization, and Uniform Traffic Filters.

Data Compression

Configurable on a per-circuit or link basis, Nortel Networks software-based Data Compression feature is supported by all Nortel Networks routers, maximizing internetwork performance by reducing the amount of bandwidth required to transport traffic over the WAN. Data Compression is supported over Frame Relay, X.25, and PPP (over leased lines and dial-up analog or ISDN links), maximizing throughput over ARN full-duplex WAN links.

Traffic Prioritization

To ensure the highest quality of service, Traffic Prioritization allows high-priority delivery to be assigned to time-sensitive and/or mission-critical traffic. Traffic Prioritization reduces the occurrence of session timeouts and improves application response times. Priority filters can be configured to

place packets into one of three priority queues—high, normal, or low. Priority filters can be applied to the complete family of network and bridging protocols supported by Nortel Networks routers. Priorities can be assigned to packets based on their protocol, source, destination address, packet type, and other protocol-specific fields. Other fields that are identifiable by a fixed offset in a packet can also be assigned priorities.

Traffic Prioritization uses either a strict dequeuing algorithm or a bandwidth allocation dequeuing algorithm to transmit packets across a serial line. Strict dequeuing transmits all packets from the high-priority queue before transmitting packets from the normal and low-priority queues. Bandwidth allocation dequeuing ensures that large amounts of high-priority traffic do not prevent transmission of other traffic, based on configurable bandwidth allocation percentages for each queue.

Uniform Traffic Filters
Inbound and outbound Uniform Traffic Filters can be applied to all network and bridge protocol traffic. Uniform Traffic Filters is a useful tool for network administrators in developing an effective and comprehensive network security strategy. In addition, Uniform Traffic Filters preserves WAN bandwidth and can increase performance by reducing network congestion.

Uniform Traffic Filters can be configured to accept or drop packets at any Nortel Networks router's network interface. Additionally, they can log matches between a packet and a filter, providing an audit trail for particular network activity.

Differentiated Services for QoS

In addition to other traffic management features, BayRS supports Differentiated Services (DiffServ) for scalable, end-to-end, standards-based IP QoS. The ARN will classify and condition packets by setting Differentiated Services Code Point (DSCP) bits based on policy filter information. Policy-based filters may be statically defined or set dynamically from the central Optivity Policy Server. DiffServ identifies three classes of Service: Expedited Forwarding, Assured Forwarding, or Default. Several dequeuing mechanisms are supported for such traffic, including Strict Dequeuing, Bandwidth Allocation, Weighted Fair Queuing (WFQ), Random Early Detection (RED, and Weighted Random Early Detection (WRED).

Remote installation and management

Remote installation of the ARN router is simplified through the use of EZ Install and EZ Update, two software applications designed to make installations, reconfigurations, and software updates from a central site quick and easy. In addition, remote management is facilitated by the DCM's standard Ethernet RMON features, which can be used to analyze the attributes and operating patterns of the remote network.

EZ Install
The EZ Install application eliminates the time and expense of sending a technical resource to install and configure an ARN router. At the remote site, once the LAN and serial interfaces of the ARN are connected and the unit is powered up, the ARN obtains its software image from flash memory and its configuration file from EZ Install over the network. By using EZ Install, the ARN is able to automatically obtain its IP address from a central site Nortel Networks router, and its configuration file from a central site server using the BootP protocol *(see Figure 4)*. After verifying that a configuration file has been successfully downloaded to the DRAM of the ARN via EZ Install, the configuration data is saved to flash memory for nonvolatile local storage.

EZ Update
The EZ Update application facilitates the automatic downloading of software updates and configuration files, minimizing the time and expense associated with remote site software maintenance. The existing ARN configuration file and software image are stored in the nonvolatile flash memory of the ARN for use as backup in case problems are encountered while downloading new software.

To use EZ Update, the ARN is dynamically configured to boot its configuration file and software image from the central site. The ARN can then be rebooted or power-cycled, and a new configuration file and/or software image downloaded to the DRAM of the ARN from a central site server. Once it has been determined that the new configuration file or software update is acceptable, it can be saved to the flash memory of the ARN, replacing the previous configuration file and/or software image.

SNMP-based node management
Nortel Networks Optivity network management applications deliver a complete, SNMP-based enterprise management solution that provides operation, policy, and design services for end-to-end management of routers, hubs, and switches. This approach enables proactive network planning and accelerates problem solving, resulting in reduced costs associated with owning and operating corporate internetworks of any size.

Router system management
System management directly supports the Bay Command Console (command line interface), HTTP-based, SNMP-based, and the Technican's Interface for router configuration (static and dynamic), monitoring, and management services. Depending on the service, these can be accessed out-of-band, through a local console or modem connection or in-band through a telnet connection.

The Bay Command Console (BCC) is a terminal-based (TTY-compatible) tool that enables device configuration and maintenance. The BCC addresses customer requirements to provide a complete, easy-to-use, and efficient management interface. The BCC provides a simplified, English word-style command set. The BCC provides an integrated collection of tools for effective configuration, monitoring, and debugging of a network device. The BCC allows you to enter Technician Interface commands and scripts at the BCC command line prompt. The BCC provides access to, and manipulation of, the Nortel Networks router MIB. The BCC is accessed through the terminal-based Technician Interface (TI).

The Technican Interface tool enables basic configuration and maintenance. The Technician Interface is based on a simple command line interpreter that supports SNMP-based access to the Management Information Base (MIB), displays event logs, and supports file system management and other administrative commands.

Table 2: ***Nortel Networks ARN specifications***

Technical specifications

Architecture	- Base module using Motorola MC68040 microprocessor - Two adapter modules per base module - One expansion module per base module - Two data collection modules—one per base module and one per expansion module	
Connectivity	- Ethernet (15-pin AUI connector, RJ-45) - Token Ring (9-pin AU connector) - 10/100Base-TX (RJ-45) - 100Base-FX (ST) - Serial (44-pin: RS-449/422, RS-232, RS-530, V.28, V.35, X.21) - ISDN BRI S/T (RJ-45) - ISDN BRI U (RJ-45: integral NT1) - 56/64-kbps DSU/CSU (RJ-45) - T1/FT1 DSU/CSU Adapter Module (RJ-45) - E1/FE1 Adapter Module (RJ-45) - E1/FE1 Adapter Module (BNC) - V.34 Modem (RJ-45)	
Packaging	Type	Tabletop/Wall-Mount/Rack-Mount
	AC voltage	100/240 VAC at 1.0 A maximum
	Wall receptacle	NEMA 5-15R (100/240 VAC) (for use in North America)
	DC voltage	
	- Input	Voltage -48 to 60.7 VDC (±20%)
	- Input	Current 1.5 A max.at -38 VDC
	Height	2.80 in. (7.12 cm)
	Width	17.25 in. (43.84 cm)
	Depth	12.50 in. (31.77 cm)
	Weight	15 lb (6.80 kg)
Environmental and regulatory	Altitude	0 to 8000 ft (0 – 2400 m)
	Humidity	10% to 90% (noncondensing)
	Temperature	32° to 122° F (0° to 50° C)
	Safety	UL 1950, TUV EN60 950, CSA 22.2 950
	RFI/EMI	FCC Part 15, VDE 0878, Limit B, CISPR 22B

Table 3: *ARN software functionality and availability*

Functionality and availability

Feature	IP access	Remote office	Corporate
BayRS options			
Network protocols			
- IP	•	•	•
- Novell IPX		•	•
- AppleTalk Phase2		•	•
- DECnet Phase IV			•
- Banyan VINES			•
- OSI			•
- Xerox XNS			•
IBM integration			
Source Route Bridge	•	•	•
LAN Network Manager Agent		•	•
Data Link Switching for Ethernet and Token Ring	•	•	
Data Link Switching for SDLC		•	•
Transparent Sync Pass-Through	•	•	•
BSC Pass-Through		•	•
APPN			•
Bridging			
Transparent (Ethernet)	•	•	•
Translation Bridge Ethernet/Token Ring	•	•	•
Native Mode LAN (NML)	•	•	•
Wide Area Networking			
HDLC Encapsulation	•	•	•
PPP	•	•	•
Frame Relay	•	•	•
SMDS	•	•	•
X.25 (including IPEX)	•	•	•
AT DXI	•	•	•
Dial Backup	•	•	•
Bandwidth-on-Demand	•	•	•
Dial-on-Demand	•	•	•
Traffic management			
Data Compression	•	•	•
DiffServ Queue Management Services	•	•	•
Traffic Prioritization	•	•	•
Uniform Traffic Filters	•	•	•
Multiline Circuits	•	•	•
Dial Optimized Routing	•	•	•
Node management			
EZ Install/EZ Update	•	•	•
Dynamic Loader	•	•	•
RMON (requires DCM hardware option)	•	•	•

Table 4: *ARN router ordering information*

Ordering Information

Model No.	Description
Ethernet Base Module	
CV1001003	ARN with one Ethernet interface and 8 MB DRAM memory (110/220 V)
CV1001004	ARN with one Ethernet interface and 16 MB DRAM memory (110/220 V)
CV1001005	ARN with one Ethernet interface and 32 MB DRAM memory (110/220 V)
CV1001008	DC ARN with one Ethernet interface and 8 MB DRAM memory
CV1001009	DC ARN with one Ethernet interface and 16 MB DRAM memory
CV1001010	DC ARN with one Ethernet interface and 32 MB DRAM memory
CV1001013	ARN with one 10/100Base-TX Ethernet Autosense interface and 8 MB DRAM memory (110/220 V)
CV1001014	ARN with one 10/100Base-TX Ethernet Autosense interface and 16 MB DRAM memory (110/220 V)
CV1001015	ARN with one 10/100Base-TX Ethernet Autosense interface and 32 MB DRAM memory (110/220 V)
CV1001018	ARN with one 100Base-FX Fast Ethernet interface and 8 MB DRAM memory (110/220 V)
CV1001019	ARN with one 100Base-FX Fast Ethernet interface and 16 MB DRAM memory (110/220 V)
CV1001020	ARN with one 100Base-FX Fast Ethernet interface and 32 B DRAM memory (110/220 V)
Token Ring Base Module	
CV1101003	ARN with one Token Ring interface and 8 MB DRAM memory (110/220 V)
CV1101004	ARN with one Token Ring interface and 16 MB DRAM memory (110/220 V)
CV1101005	ARN with one Token Ring interface and 32 MB DRAM memory (110/220 V)
WAN Adapter Modules	
CV0004001	Serial Adapter Module
CV0004002	ISDN BRI S/T (without NT1) Adapter Module
CV0004003	ISDN BRI U (with NT1) Adapter Module
CV0004004	56/64K DSU/CSU Adapter Module
CV0004005	V.34 Modem Adapter Module (North American only)
CV0004023	T1/Fractional T1 DSU/CSU Adapter Module (North American only)
CV0004022	X.25 PAD Module
CV0004024	E1/FE1 Adapter Module (RJ-45)
CV0004025	E1/FE1 Adapter Module (BNC)
Expansion Modules	
CV0004011	Tri-Serial Expansion Module
CV0004012	Ethernet Expansion Module
CV0004013	Token Ring Expansion Module
CV0004014	Ethernet plus Tri-Serial Expansion Module
CV0004015	Token Ring plus Tri-Serial Expansion Module
CV0004026	ARN Ethernet 7-Serial Expansion Module
CV0004027	ARN 7-Serial Expansion Module
System Software	
CV0008091-15.x	BayRS for IP Access on 8 MB PCMCIA flash
CV0008092-15.x	BayRS for Remote Office on 8 MB PCMCIA flash
CV0008093-15.x	BayRS for Corporate on 8 MB PCMCIA flash
CV0008094-15.x	BayRS for IP Access on 16 MB PCMCIA flash
CV0008095-15.x	BayRS for Remote Office on 16 MB PCMCIA flash
CV0008096-15.x	BayRS for Corporate on 16 MB PCMCIA flash
x = software version number (e.g., 1, 2, etc.)	
Data Collection Module	
CV0004021	Ethernet RMON DCM—fits base module and/or expansion module
Console Modem Module	
CV0004020	V.34 Console Modem module (North American only)
Redundant Power Supply Unit	
RPSU	Redundant Power Supply Unit (low watt)

HTTP-based monitoring

The embedded Web server complements and extends the functionality of existing SNMP-based and command line interfaces (CLIs) such as Site Manager and the TI/BCC.The HTTP-based interface allows authorized Web browsers to access device management information for monitoring and troubleshooting. Users can display event logs, support file system management, and other administrative commands. Users can directly access the BCC from their browser window to resolve configuration issues.

Ordering Note: *Adapter modules, expansion module, and system software must be ordered separately for each ARN. Each ARN includes an installation manual, power cord, and console cable kit. The purchase of one complete set of Nortel Networks documentation (Router Installation Documents, Router Management Documents, and Technician's Interface and Hardware Documents) for each central site is recommended.*

Acronym Glossary

APPN	Advanced Peer-to-Peer Networking
ARN	Advanced Remote Node
BayRS	Nortel Networks Routing Services
BCC	Bay Command Console
BRI	Basic Rate Interface
BSC	Binary Synchronous Communications
CLI	Command Line Interface
CSU	Channel Service Unit
DCM	Data Collection Module
DLSw	Data Link Switching
DR M	Dynamic Random Access Memory
DSU	Data Service Unit
IP	Internet Protocol
IPX	Internet Protocol Exchange
L N	Local Area Network
MIB	Management Information Base
NML	Native Mode L N
NT1	Network Termination 1
PPP	Point-to-Point Protocol
PTT	Public Telephone and Telegraph
RFC	Request For Comment
RMON	Remote Monitoring
RPSU	Redundant Power Supply Unit
SDLC	Synchronous Data Link Control
STP	Shielded Twisted Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UTP	Unshielded Twisted Pair
WN	Wide Area Network

NORTEL NETWORKS™

Nortel Networks is an industry leader and innovator focused on transforming how the world communicates and exchanges information. The company is supplying its service provider and enterprise customers with communications technology and infrastructure to enable value-added IP data, voice and multimedia services spanning Metro Networks, Wireless Networks, and Optical Long Haul Networks. As a global company, Nortel Networks does business in more than 150 countries. More information about Nortel Networks can be found on the web at:

www.nortelnetworks.com

In the United States:
Nortel Networks
35 Davis Drive
Research Triangle Park,
North Carolina 27709
USA

In Canada:
Nortel Networks
8200 Dixie Road,
Suite 100
Brampton, Ontario L6T 5P6
Canada

In Europe:
Nortel Networks
Maidenhead Office Park
Westacott Way
Maidenhead Berkshire SL6 3QH
UK

In Asia:
Nortel Networks Singapore Pte Ltd
151 Lorong Chuan #02-01
New Tech Park,
Singapore 556741

In Australia:
Nortel Networks Australia Pty Limited
380 St. Kilda Road
5th/6th Floor
Melbourne, Victoria
Australia 3004

For more information, contact your Nortel Networks representative, or call 1-800-4 NORTEL or 1-800-466-7835 from anywhere in North America.

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11026.02/02-02